U.S. DOE Natural Gas / Renewable Energy Hybrids Workshop

Break Out Session Results

Group II - Village Power

August 21, 2001

Characteristics of a Typical Village Hybrid Demonstration Project

- 1 – 100 dwellings
- Remote location
- Off-shore and on-shore
- Domestic and less developed countries
- Project must be market driven with a good business case
- Need to consider cultural implications of the project (service & maintenance)
- Need to consider an end-game application (i.e. rethink the goal)
- Fully integrated site specific solutions

New Hybrid Concepts

- Look for synergy with non-energy related infrastructure to leverage added capacity. Example look for rural telecommunication towers and negotiate a larger power supply that could then meet communication needs as well as the electrical needs of rural energy customers.
- New thermo-chemical technology for mixed alcohol production.
- Co-fire coal with biomass in a small modular rig.
- Wind systems and others with flywheel as backup storage to smooth intermittency.
- Mixed alcohol generation with new catalyst for hydrogen generation in a fuel cell application.
- New concepts need to reduce cost and increase efficiency.

Technology Issues

- Wind and PV systems have storage issues
  - Batteries as a backup storage device don't last
  - High tech batteries are too costly
- Capital cost is too high
- Need sufficient testing before deployment for enhanced robustness
- System controls (wind systems can learn from diesel gensets)
- System integration issues
  - System engineering
  - Fuel production / distribution
  - Site specific
- Need to increase the robustness of the technology

Markets for Village Hybrid Applications

- Rural remote residential cases
- World-wide there is the potential for many applications with financing available however the technology is not sufficiently demonstrated or robust to gain support
- There is a niche for energy service companies to deploy and replicate hybrid systems leading to large-scale deployment
- There is a market for the use of animal and agricultural waste as a fuel source
- Look for synergies between existing infrastructure and the need for power i.e. the telecommunications power supply with excess power for other uses

How Can the Federal Government Be Part of the Solution?

Be cognizant of:

- Different market groups
- An application focus
- Timing of market entry for technology
- Technology characteristics
- Make a market case

Consensus Points

- Technology needs to be market driven for both domestic and under developed country applications.
- Focus technology development on system integration and storage issues
- Must consider application development.
- The Fed should not work on commercially ready hybrid technology.
- The village power application size is generally less than 100 kW and generally much less

Other Notes

- PV is great for the individual single home (in less developed countries) and may be the first step in advancing the local standard of living however hybrid systems need to consider high quality power with a community based application for a sustainable society (rethink the goal with an eye on a large scale sustainable applications).

Conclusions

- Make it market driven
- Work on system integration issues and storage systems for wind and PV
- U.S. based demonstration before deployment